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Hand Tremor and Activity Sensor

A sensor system has been developed for detecting hand tremor and activity and transmitting signals over a distance of at least 3 meters to a receiver system. Designed for use in studies of the effect of fatigue on an individual's judgment or reaction time, the sensor is installed within the mounting of a finger-ring; no external wiring or power source is needed.

The sensor assembly that is mounted in the ring consists of a miniature, semiconductor strain-gage single-axis accelerometer, an astable multivibrator, a sample-and-hold circuit, an FM oscillator-transmitter, and a battery. The accelerometer is noteworthy because of its small size and relative insensitivity to cross-axis acceleration. It is comprised of a symmetrical seismic mass supported on a chemically-etched beam-and-ring; a pair of strain gages is bonded to the beam—ring assembly. Accelerations of the hand are converted to stresses in the beam—ring assembly and thence to resistance values by the strain gages. Inasmuch as the resistance of the strain-gage bridge changes in direct proportion to the beam stress, passage of a current through the bridge provides a voltage signal which modulates a transmitter.

Acceleration sensitivity of the 500-ohm accelerometer system is designed to be 350 $\mu\text{V/g}$. Low-power operation is achieved by use of pulsatile

bridge excitation (accelerometer gage) and pulsatile rf transmission; thus, the circuitry converts average signals from the accelerometer into a series of rf bursts. The rf burst-interval is modulated so as to contain the required analog output information.

Note:

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Patent status:

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